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Positron Spectroscopy of Defects in Aged Molecular Solids*

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The evolution of defects in carbon composites and molecular crystals during aging has been studied with a 3 MeV positron beam at Lawrence Livermore National Laboratory. Positron annihilation lifetime spectroscopy (PALS) provides non-destructive analysis of average defect size and concentration. The high-energy beam probes the bulk structure of large ($\sim 1 \text{ cm}^3$) engineering samples. Using two annihilation detectors in coincidence, spectra free of systematics can be obtained even from low-density, non-stopping samples.

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